Explanation of Significant Differences

Southeast Rockford Groundwater Contamination Site
Rockford, Illinois
Source Area 7 Hot Spot Soil Removal

Introduction to the Site and Statement of Purpose

This Explanation of Significant Differences (ESD) describes a change in the remedy to address contamination in a portion of Source Area 7, which is part of the Southeast Rockford Groundwater Contamination Site in Rockford, Illinois (Site) figure1. This ESD proposes to modify the existing remedy for a small hot spot area within Source Area 7 to include excavation of subsurface materials in order to remove soil contamination that serves as a source of groundwater contamination (See Figures 1 and 2). The modified remedy will enhance the groundwater restoration process. The actions proposed in this document are taken pursuant to Sections 104, 107 and 122 of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), as amended, 42 U.S.C. §§ 9604, 9607 and 9622; and the National Contingency Plan (NCP), 40 C.F.R. Part 300. CERCLA Section 117(c), 42 U.S.C Section 9617(c), and 40 C.F.R. 300.435(c)(2)(i) of the NCP authorize the publishing of an ESD when the differences in the remedial action to be taken significantly change, but do not fundamentally alter, the remedy selected in the remedial decision. More fundamental changes would require an amendment to the remedial decision.

Environmental problems at the Southeast Rockford site are complex as a result of the intermixing of residential, commercial and industrial development throughout this area. As a result, the Illinois Environmental Protection Agency and the United States Environmental Protection Agency (U.S. EPA) organized the work into three operable units, as follows:

Operable Unit #1: Contamination in Residential Wells - Alternate Water Supply - Initial Extension of Alternate Water Supply

Operable Unit #2: Additional Alternate Water Supply Extension - Selection of Natural Attenuation with Establishment of Groundwater Monitoring Network to Achieve Overall Contaminated Plume Remediation - Commitment to Reduce Impact of Significant Source Areas

Operable Unit #3: Source Control Technology Selected for Four Leading Source Control Areas - Extent of Contaminated Soil Areas/Local Groundwater Management Zones Established

Source Area 7 is one of the four significant groundwater contamination source areas as described in the June 2002 Record of Decision (ROD) for Operable Unit #3. Further source control in these four areas would help reduce continued migration of contaminants into the overall plume of contamination as established in Operable Unit #2, and aid in reducing the time needed to achieve overall aquifer restoration goals.

The 2002 ROD for Source Area 7 identified air sparging (AS), coupled with soil vapor extraction (SVE), as the appropriate remedy for the contaminated soils impacting the groundwater. As a result of pre-design/pilot study work conducted from 2003 to 2007, it has been established that a portion of Source Area 7, located within Ekberg Pine Manor Park (the park), has soil contamination four to 15 feet below the ground surface. Additionally it was determined that these soils contain significant amounts of fine grained materials. Excavation and appropriate treatment/disposal of these relatively shallow soils would aid in simplifying the overall design of the AS/SVE system for this area, as well as enhance the system performance by

removing some of the fine grained materials which inhibit vapor extraction. In addition to the soil remedy, multiphase extraction was selected as a leachate source control remedy.

These changes do not fundamentally alter the previously selected remedy for Source Area 7 as discussed in the June 2002 ROD. Therefore, a ROD amendment is not required and the change can be effected via this ESD. This ESD will become part of the administrative record file for the Site, as noted in the NCP at 40 C.F.R. 300.825(a) (2).

The State of Illinois is the lead agency for the Area 7 portion of Operable Unit 3; U.S.EPA is the support agency.

The Site administrative record file and site repositories may be found at the Springfield, Illinois and Chicago, Illinois offices of the IL EPA and U.S. EPA, respectively:

U.S. EPA Records Center
77 West Jackson Boulevard
Room 7 South
Chicago, Illinois 60604 (Administrative Record)
Hours: Monday to Friday 8:00 am to 4:00 pm

Illinois EPA
Bureau of Land
1021 North Grand Avenue East
Springfield, Illinois 62702 (Administrative Record)
Hours: Monday to Friday 8:30 am to 5:00 pm

In addition to the Springfield, Illinois and Chicago, Illinois offices of the IL EPA and U.S. EPA, respectively, the site administrative record file and site repositories may be found locally at:

Rock River Branch- Rockford Public Library
3128 South 11th Street
Rockford, Illinois (Repository)

Rockford Public Library - Main Branch
215 North Wyman Street
Rockford, Illinois (Administrative Record)

Site History, Contamination, and Selected Remedy

The Southeast Rockford Groundwater Site (EPA ID. No. ILD981000417) (Site) is located within the southeast portion of Rockford, Winnebago County, Illinois and consists of an area approximately 3 miles long by 2 and one half miles wide. Area 7 is located in the most southeastern portion of the Superfund site, northwest of the intersection of Alpine and Sandy Hollow Road. More specifically, Area 7 is located at the eastern end of Balsam Lane and contains Ekberg Park, a municipal park owned and maintained by the Rockford Park District

(figure 1). Source Area 7 is primarily an open grassy area and also contains paved tennis and basketball courts, playground equipment and a parking area. It is surrounded regionally by residential areas with some commercial development along Sandy Hollow Road. The area directly surrounding the park, which is part of Source Area 7, is currently owned by Mr. Glen Ekberg.

Source Area 7 has a history of unregulated disposal activity which is suspected to have begun sometime in the early 1950's. Part of the history of this area includes a former gravel pit. There is evidence of ground disturbances in historic aerial photographs. Specifically, a 1970 aerial photograph shows evidence of excavation and disturbed ground in two large areas approximately 600 and 1300 feet east of Balsam Lane. Further examination of aerial photography from 1958, 1964 and 1970 revealed former small tributary valleys with evidence of disturbance. In addition, Illinois EPA had received numerous reports of illegal dumping in this area.

Site investigations identified the presence of elevated concentrations of ethylbenzene, toluene, xylene, and chlorinated VOC's in soil borings and soil gas samples. Groundwater monitoring well MW106 revealed elevated concentrations of volatile organic compounds (VOCs) in shallow groundwater, leading to this area being designated as one of the primary source areas. The soil gas survey along with geophysical surveys helped identify individual sources of dumping within Area 7 itself. Further investigation since discovery, including additional groundwater monitoring wells, further characterized the nature and extent of contamination within Source Area 7 and the park.

The Pilot test performed in 2007 in the area just to the west of the playground equipment revealed a large plume of soil and groundwater contamination. A pump test conducted in this area revealed that the subsurface consists of very fine grained materials. The presence of these materials, which are primarily clays and silts, indicate that a substantial amount of the contamination will continue to be held in place by the soil and will not be effectively removed by SVE/AS. Contamination was found to be located between 4 and 15 feet of the ground surface, much shallower than first indicated by earlier investigations. The nature of the glacial deposits at this specific location and the soil boring indicates that the contamination will be held in place significantly longer than previously anticipated, due to the fine grained materials.

The Site was proposed for addition to the National Priorities List (NPL), 40 CFR Part 300, Appendix B, in June 1988, and was listed on March 31, 1989, 54 Fed. Reg.13,296. This listing stemmed from the State of Illinois discovering the groundwater problem at the Site between 1981 and 1988. In 1989, U.S. EPA initiated a Superfund time-critical removal action to place residents with VOC contamination in their drinking water wells equal to or greater than 25% of removal action levels under CERCLA, on bottled water as a temporary measure. In December 1989, the same residents received point-of-use carbon filters from U.S. EPA. Ultimately, U.S. EPA extended water mains and provided service connections for 283 residences as part of the removal action. This action was completed in 1991.

Illinois EPA began work on the Operable Unit #1 Remedial Investigation/Feasibility Study

(RI/FS) in 1990. U.S. EPA and Illinois EPA developed a proposed plan for Operable Unit #1 at the Site in March 1991. The ROD for Operable Unit #1 was signed on June 14, 1991. The Operable Unit #1 ROD required additional affected area residences to be hooked into the City of Rockford municipal water system, and required a granular activated carbon water treatment unit be installed at a Rockford municipal well contaminated by VOCs. Including the previous residences covered by the U.S. EPA time-critical removal, by November 1991, 547 residences and homes were hooked up to Rockford municipal water. In December 1992, U.S. EPA issued a Remedial Action Report certifying that the selected remedy for Operable Unit #1 was operational and functional.

Remedial Investigation (RI) required for Operable Unit #2 began in May 1991 under direction of the Illinois EPA. The objective of the Operable Unit #2 RI was to characterize the nature and extent of groundwater contamination throughout the Site, and to develop information on the source areas of the residential well contamination. Phase II activities included soil gas points, soil borings, installation of groundwater monitoring wells and groundwater sampling. Remedial Investigation field activities were completed by 1994, resulting in the Illinois EPA issuing a Proposed Plan for Operable Unit #2 in July 1995. Phase II identified four major source areas that were impacting the Site, identified as Source Area's 4, 7, 9/10 and 11. The ROD for addressing Operable Unit #2 was signed on September 29, 1995. It required further water hookups for homes and businesses projected to be in the overall Site area affected by contaminated water. In addition, it proposed groundwater monitoring for 205 years along with future source control measures to be developed for the four groundwater contamination source areas, including Source Area 7. In January 1995 Illinois EPA issued the Groundwater Remedial Investigation which summarized the findings from the Phase II field activities that were conducted from January 1993 through January 1994.

In May 1996, Illinois EPA began the Operable Unit #3 RI/FS which was designed to characterize the nature and extent of contamination at the four primary source areas. The RI/FS involved soil gas sampling, soil borings, well installation and groundwater sampling for the Southeast Rockford Groundwater Contamination Site, including Source Area 7.

The results of the Operable Unit #3 RI/FS characterized the four source areas, including Source Area 7. These findings and determinations are described in the June 11, 2001 Proposed Plan for the ROD in the 'Description of Source Areas.' Illinois EPA and U.S. EPA hosted a number of public informational meetings during summer 2001, in order to explain and take comments on the Proposed Plan. During the fall and winter 2001, Illinois EPA and U.S. EPA prepared Responses to Comments in anticipation of issuing a ROD in spring 2002. The Operable Unit #3 ROD was issued on June 11, 2002.

Remedial technology selected for Source Area 7 in the Operable Unit #3 ROD includes soil vapor extraction (SVE) and air sparging (AS), with vapor treatment by catalytic oxidation, for contaminated soils above and below the groundwater table. The remedy also includes a leachate containment system along the down-gradient side of Source Area 7. Multiphase extraction wells are planned within the source area to remove more highly contaminated material, including

NAPLs and DNAPLs. The pumped leachate will be treated with air stripping and the vapors from the unit will be treated by a catalytic oxidation unit. A groundwater management zone (GMZ) shall be established for Source Area 7 to assist in effectively monitoring the effectiveness of the remedy.

Additional information concerning the scope of contamination and remedy development may be found for all Site operable units in the Administrative Record file and in the ROD database as maintained by Illinois EPA and U.S. EPA.

Basis for the Document – Source Area 7 Information

Upon completion of the Pilot Testing conducted in 2007 Illinois EPA found contaminated soil much shallower than previously detected in earlier investigations in a hot spot area just west of the playground equipment in Ekberg Park. By augmenting the selected remedial actions with limited excavation in this hot spot, the overall time required for both soil and leachate remediation may be reduced significantly. Through excavation and off-site disposal of these fine grained source materials, overall groundwater quality may be restored more quickly allowing more timely compliance with State of Illinois Class I Groundwater Standards. Currently, The City of Rockford, Illinois, and Winnebago County draw 100% of their water supply from groundwater through private, industrial and municipal supply wells. Therefore, any elimination of groundwater contamination source materials will ultimately assist in reestablishment of the groundwater to Class I groundwater standards.

A. Benefits of Excavation in the hot spot include:

1. Excavation removes groundwater contamination source material, quickly (within 1-2 years) and permanently. Removal of this hot spot will allow the proposed SVE/AS system for Source Area 7 to be more cost efficient and streamlined.

2. Excavation is guaranteed effective. Prior to shut down, the SVE system will require verification of effectiveness via soil sampling once VOC levels in the SVE vapor drop off. There is no guarantee at that point that a sufficient amount of contamination will have been removed from the hot spot to allow certification that the remediation is complete. See part B for reasons SVE may not be as effective as it might need to be.

3. Excavation is easily implemented and easily verified for completion. Unlike SVE, there will be no need to periodically assess the effectiveness of excavation or spend time and money to tweak or upgrade the remedy every few years, with no guarantee of ultimate success. Verification of completion for the excavation can be accomplished through soil sampling and analysis with definitive results within a few days.

4. Excavation will quickly eliminate releases to air. Low levels of several site-derived VOCs have been detected in ambient air in parts of Source Area 7 as well as in some indoor air. Although these levels do not constitute a substantial health risk as determined

by studies of potential vapor intrusion in the nearby neighborhood, excavation in the hot spot area would further mitigate releases from this area to ambient air once the excavation was performed and more rapidly eliminate releases to indoor air. SVE/AS would slowly reduce the risk to ambient and indoor air over a period of several years to several decades. Given that this hot spot area is adjacent to the park, removing this risk to young children would be especially beneficial. Impacted homeowners will realize immediate improved indoor air quality.

5. Excavation should substantially reduce the time required for leachate and groundwater remediation. The quicker the bulk of the source is removed, the quicker the groundwater contamination will be reduced to acceptable levels. This includes the contaminated leachate beneath Source Area 7 as well as the contaminated groundwater beneath the Site as a whole. Because Source Area 7 is a major source of contamination to the Southeast Rockford groundwater plume, source removal at this location has the potential to substantially decrease contaminant concentrations in a large area relatively quickly. This remediation will lower long-term monitoring costs and allow the aquifer to be returned to beneficial use in a shorter time span.

Source Area 7 Findings and Description of Significant Differences

B. Problems with SVE/AS for Complete Hot Spot Removal

1. Localized geology will preclude optimal SVE/AS operation. Based on historic data and more recent treatability testing data, the subsurface soils in the hot spot area contain substantial amounts of silt and clay. The treatability testing, which included an SVE pilot test, indicated that an SVE system in these silts and clays would have a fairly small radius of influence (area over which SVE can collect vapors). While there are also inter-bedded layers of sand and gravel, which have a larger radius of influence, the SVE/AS system in this area would need to be designed for the worst case soils. The heterogeneity in the geology in this area will increase the cost, operation, maintenance and overall remediation time if SVE/AS is the sole remedial technology.

2. Source Area 7 Hydrology will preclude optimal SVE/AS operation. The water table beneath Source Area 7 has varied on the order of 15 feet based on the water level measurements that have been taken over the past 10 to 15 years. Because SVE only works on unsaturated material, this variability presents a challenge for determining the necessary depth of the SVE/AS wells at the time of their installation. Additionally, because changes in water level will create changes in the location of the various geologic materials in Source Area 7 (sand and gravel lenses and silt and clay layers) relative to the water table; different geologic media, with different air transmitting properties, would have to be pumped at different times during the year and over multiple years. As was demonstrated by the SVE pilot test, this variability in the geologic material through which air is flowing will result in variable SVE extraction rates, variable radius of

influence for the SVE system, and variable (reduced overall) effectiveness at removing VOCs.

These factors will complicate the design, operation and maintenance of the SVE system, and reduce its effectiveness. It is probable that once the SVE system is up and running, it will require at least one upgrade as well as frequent adjustments during operation, which will increase its costs.

3. The location of the contaminants will preclude optimal SVE/AS operation. Much of the VOC mass (potentially including NAPL) is located within the hot spot silt and clay deposits, which bind the VOCs with clay minerals and organic carbon. VOCs bound to clay minerals and organic carbon are relatively difficult to mobilize into the vapor phase, which is necessary for their extraction from the soil via SVE.

   If substantial amounts of VOCs are in the silts and clays, but most of the air pumped will move through the sand and gravel when it is unsaturated, VOC removal will be limited by diffusion out of the silt and clay into the sand and gravel. These phenomena will reduce the overall effectiveness of the SVE, as well as increase the cost and time required for remediation.

C. Excavation in the Hot Spot will Enhance Performance of the Selected Remedy

1. There are valid technical reasons to modify the selected remedy for soils in Source Area 7. At the time the ROD was signed in 2002 it was assumed that SVE/AS would be fairly effective and easy to implement in Source Area 7. Since that time there have been additional investigations into the nature and extent of soil contamination in Area 7. This particular hot spot area has been better defined including the geology, presence of NAPL and the three dimensional location of the bulk of the contamination.

2. By excavating the hot spot overall cost savings will occur. The excavation of the hot spot soils will be a more effective and efficient way to address the soils in this area as previously discussed. Removal of the hot spot area will allow the SVE/AS design to be streamlined and focused on the areas where it will be more successful as a remedial technology. The downsizing of the overall SVE/AS system will help offset the costs of the excavation, and reduce the potential need for increased O&M and upgrades to the SVE system, which are not part of the current cost estimate.

3. There will be no need to delay start-up of Remedial Action. The need to revise the remedial design to account for hot spot soil excavation and off-site disposal may delay start up of the excavation by a few months, but this would be more than offset by the speed with which excavation would remove the VOCs in the hot spot subsurface soils. Other components of the remedy could still proceed so as not to substantially delay overall implementation.

4. Excavation of this hot spot and the non aqueous phase liquid (NAPL) will eliminate the need for catalytic oxidation for the SVE vapors thus eliminating emissions as a concern and potentially reduce the overall costs. Elimination of the Catalytic oxidation unit or some comparable technology is likely. This will eliminate the necessity for an emissions stack which was a concern of the residents of nearby Pine Manor subdivision located directly west of Ekberg Park.

Change in Remedy Execution

The Remedial Design (RD) for Area 7 will require modification to both include the excavation component and streamlining of the SVE/AS system design. The RD is currently at the 30% phase so these changes will be easily implemented. The design for the excavation will include how the proposed excavation and off-site disposal/treatment would be conducted as well as the remedy completion sampling, testing, backfilling and capping requirements. The design modification will also address site security and safety for the excavation work.

The modifications to the SVE/AS system will include downsizing or focusing the system on those areas within Source Area 7 where the technology will be more effective. Additionally the catalytic oxidation component for the vapors will be removed or included as an option only if determined necessary at a later date.

The Illinois EPA has determined that this is a minor change to the remedy at Area 7, but a change that does not fundamentally alter the remedy selected in the Operable Unit #3 ROD. The remedy selected in the ROD remains protective of human health and the environment and continues to meet applicable or relevant and appropriate requirements (ARARs). The accomplishment of the tasks described in this ESD will not result in conditions which would allow unrestricted use of this portion of the site. Consequently, Source Area 7 will remain subject to inclusion in future Five Year Review Reports for the Site.

Rationale for Selection of this Change to the Remedy for the Hot Spot portion of Area 7

Note that the Operable Unit #3 Area 7 decision was based on the nine decision-making criteria. These are:

Threshold Criteria -

1. Overall Protection of Human Health and the Environment - This criterion addresses whether a remedy provides adequate protection of human health and the environment and describes how risks posed through each exposure pathway are eliminated, reduced, or controlled through treatment or engineering/institutional controls.

2. Compliance with Applicable or Relevant and Appropriate Requirements (ARARs) - This criterion addresses whether a remedy will meet all of the ARARs of Federal and State environmental laws and/or justifies a waiver.

Primary Balancing Criteria - These criteria are used to weigh major tradeoffs among evaluated alternatives. They include:

3. Long-Term Effectiveness and Permanence – This criterion is concerned with the residual risk and the ability of a remedy to maintain reliable protection of human health and the environment over time, after cleanup goals have been met.

4. Reduction of Toxicity, Mobility or Volume through Treatment – This criterion evaluates the degree to which hazardous substances are treated to reduce the toxicity, mobility, or volume.

Excavation of the contaminated soil constitutes the removal of a principal threat waste from the site, but its disposal in a licensed landfill is not considered treatment.

5. Short-Term Effectiveness – This criterion addresses the period of time needed to achieve protection and any adverse impacts on human health and the environment that may be posed during the construction and implementation period until cleanup goals are achieved.

6. Implementability – Impementability is the technical and administrative feasibility of a remedy, including the availability of materials and services needed to implement a particular remedy.

7. Cost – Cost includes estimated capital and operation and maintenance costs, also expressed as net present worth costs.

The cost for excavation, transport, and disposal in an Illinois landfill of an estimated 8,500 tons of material is $1,100,000. Of that total, 5,700 tons are estimated to be classified as hazardous and will require disposal in a RCRA Subtitle C landfill. The estimated total cost of the remedy at Source Area 7 is $10,700,000.

Modifying Criteria - These criteria are usually taken into account after public comment is received on the proposed remedy. They include the following:

8. State/Support Agency Acceptance – This criterion reflects aspects of the preferred alternative and other alternatives that the support agency favors or objects to, and any specific comments regarding State of Illinois applicable ARARs or the proposed use of waivers.

Support Agency Comments - Illinois EPA is lead agency and U.S. EPA is the support agency for Area 7 of Operable Unit 3. U.S. EPA has indicated its approval of this remedial action revision. It should be noted that the partial soil excavation action at Source Area 7 is similar to remedial actions selected by Illinois EPA at another of the four major source areas discussed in

the Operable Unit #3 ROD.

9. Community Acceptance – This criterion reflects the public's general response to the remedy revision.

Evaluations under this criterion were conducting by reflecting on the public comments received during the final OU3 remedy selection and the public response during a September 24, 2009, public meeting where this proposed remedy was presented and discussed. The meeting included discussion of the route of trucks hauling soil to eliminate neighborhood disturbance and the timing of the excavation to avoid periods of high park use. Illinois EPA stated that the excavation would revert back to park area after work was complete. In general, the public was accepting and supportive of the remedy revision.

The revised remedy meets the threshold criteria of protection of human health and the environment, and compliance with ARARs. Both the original and revised remedy will be effective in the long term. The revised remedy will provide for less treatment to reduce toxicity, mobility, and volume of hazardous substances than the originally selected remedy; however, such treatment is still a major component of the revised remedy. The revised remedy has greater short term effectiveness and is more readily implemented than the originally selected remedy. Contaminated silt/clay soils near the ground surface will have caused difficulty designing the SVE system for effective operation, and would have caused very long operation time SVE system. By excavating and disposing of these contaminated soils off-site, the SVE system will more readily and rapidly address the remaining soil contamination. This reduction in the remediation timeframe will also likely result in an overall cost savings, as the costs for the excavation component will be more than offset by the reduction in construction costs and long term operation and maintenance costs associated with the SVE/AS system. Both the support agency and the community support the revised remedy.

Standards to be Attained

Remedial objectives as set forth in the June 2002 Operable Unit #3 ROD are not altered by work proposed in this ESD.

Statutory Determinations

The selected remedy satisfies the requirements of Section 121 of CERCLA, 42 U.S.C. Section 9621; which are to protect human health and the environment; comply with ARARs; be cost effective; utilize permanent solutions and alternate treatment technologies to the maximum extent practicable; and satisfy the preference for treatment as a principal element of the remedy.

The change to the remedy for hot spot area of Source Area 7 as described in this ESD continues to meet CERCLA's preference for treatment as a principal element because the originally selected soil and leachate treatment actions remain the major components of the remedy. Therefore, Illinois EPA, with US.EPA concurrence, has determined that this change to the

remedy for the hot spot portion of Area 7 satisfies provisions of CERCLA Section 121.

Public Participation Compliance

Illinois EPA, working in coordination with U.S. EPA, will make this explanation of significant differences and supporting information available to the public via the administrative record and the information repositories (noted elsewhere in this document). On September 24, 2009 Illinois EPA presented updates to the residential community at a Public Meeting hosted by the Rockford Park District. Illinois EPA will ensure that a notice that briefly summarizes the explanation of significant differences, and provides basic reason for such differences, is published in a newspaper of local circulation. Illinois EPA shall also release a fact sheet explaining site developments and this proposed excavation. By so doing, Illinois EPA will meet the public participation requirements of NCP section 300.435(c)(2)(i).

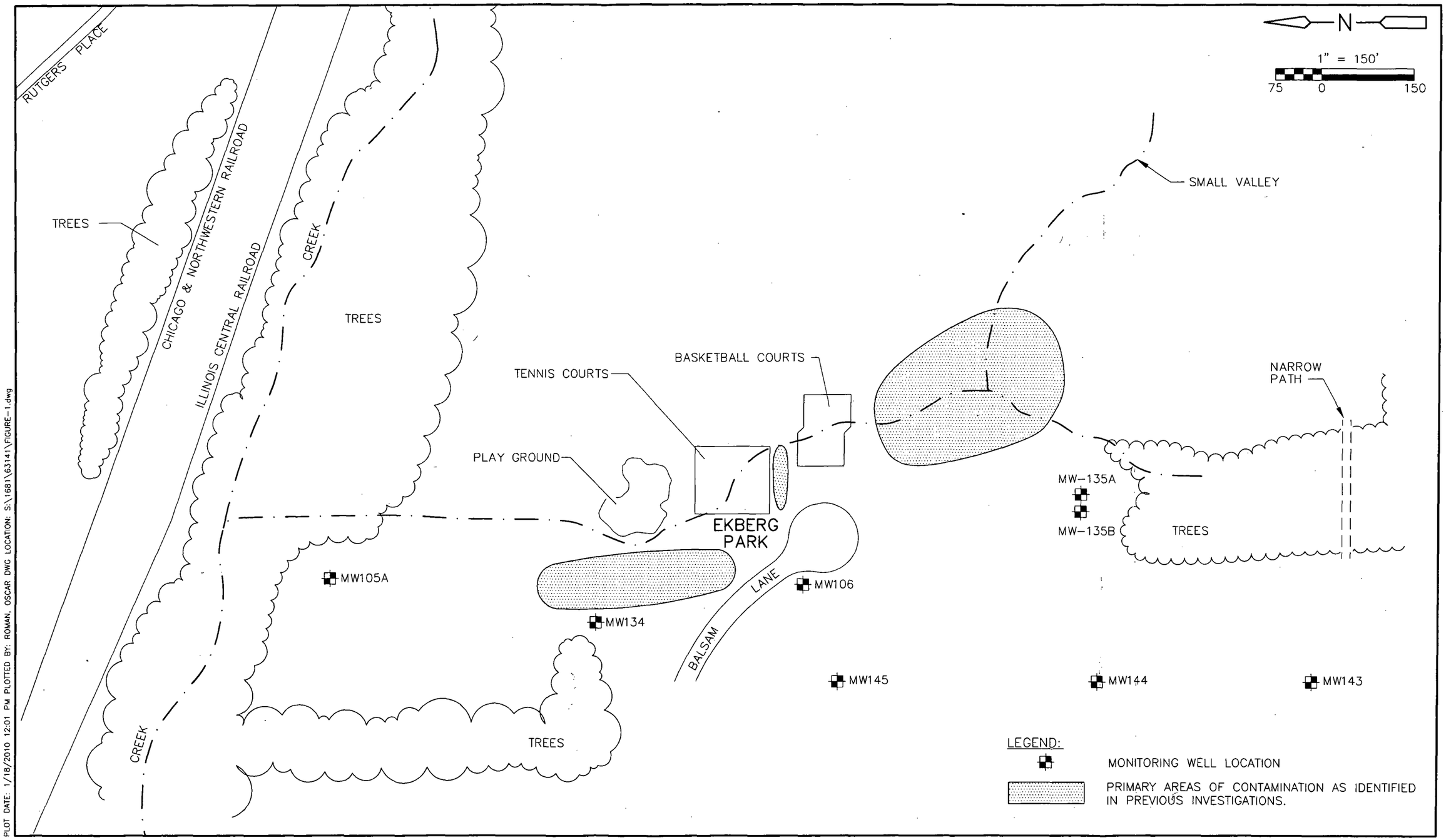
Approved by: Date:

Douglas P Scott — March 3, 2010

Douglas P. Scott, Director
Illinois Environmental Protection Agency

Richard C Karl — 5-3-10

Richard C. Karl, Director
Superfund Division



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CDM
consulting • engineering • construction • operations

Figure 1
AREA 7 PRIMARY AREAS OF CONTAMINATION


Preliminary
Excavation
Boundary
Figure 2
Proposed Excavation
Source Area 7
0
50
100
200 Feet
1 inch = 100 feet
N